REMARKS

Reconsideration of the above-identified application in view of the amendments above and the remarks following is respectfully requested.

Claims 1-46 are in this case. Claims 8 and 11 have been rejected under § 112, second paragraph. Claims 39-46 have been rejected under § 102(b). Claims 1-38 have been rejected under § 103(a).

Dependent claims 8-11 have been amended. Claims 16-19 and 39-46 have been canceled. The claims pending in this case after entry of these amendments are claims 1-15 and 20-38.

§ 112, Second Paragraph Rejections

The Examiner has rejected claims 8 and 11 under § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

Specifically, the Examiner has indicated that claim 8 does not introduce any additional limitation beyond the previously recited method steps. The Applicant has now amended claim 8 to recite more clearly that the steps of pumping, adding, generating and breaking are repeated cyclically, thereby clearly stating an additional limitation. Claims 9 and 10 which depend from claim 8 have been amended to make them consistent with the amendment of claim 8.

The Examiner has also indicated that the phrase "the higher pressure end" in claim 11 lacks sufficient antecedent basis. To address this issue, claim 11 has now been amended to specify that the specified diffusion time is introduced prior to repeating said step of pumping, thereby making it clear that the diffusion time occurs prior to the reduction of pressure in each cycle.

In view of this revised language, the Applicant respectfully submits that the claims are now free from the deficiencies identified by the Examiner under § 112, second paragraph.

§ 102(b) & § 103(a) Rejections – Claims 16-19 & 39-46

The Examiner has rejected claims 39-46 under § 102(b) as being anticipated by Jacob (US 5,302,343). The Examiner has also rejected claims 16-19 under § 103(a) as being unpatentable over Bithel (US 4,348,357) in view of D'Ottone (US 2003/0133832) and Jacob (US 5,302,343). The Examiner's rejections are respectfully traversed.

While continuing to traverse the Examiner's rejections of these claims, in order to simplify the issues currently before the Examiner and expedite the prosecution, the Applicant has chosen to cancel all claims relating exclusively to the plasma gun, namely, claims 16-19 and 39-46, without prejudice, to be presented for future consideration in a continuation application.

§ 103 Rejections – Claims 1-15 & 20-38

The Examiner has rejected claims 1-15 & 20-38 under § 103(a) as being unpatentable over Bithel (US 4,348,357) in view of D'Ottone (US 2003/0133832) and Jacob (US 5,302,343). The Examiner's rejections are respectfully traversed.

Bithel discloses a pressure-pulse plasma sterilization technique in which plasma discharge in a low pressure oxygen atmosphere generates oxygen radicals. The pressure varies in a saw-tooth pattern with the plasma activated during a rapid pressure rise time (<5 seconds) and typically deactivated during the longer pressure-fall interval. The active species (oxygen radicals) has a short lifetime, and no longer-

lasting agent is present to continue any sterilization activity during the relatively long plasma-off period of each cycle.

Jacob similarly teaches a plasma sterilization technique with various arrangements of electrodes and a wide range of gas reagents, mostly including oxygen as the primary component. The technique is typically performed under vacuum between 10 microns Hg (0.01 Torr) and 10 Torr.

D'Ottone teaches a sterilization and detoxification technique for enclosures, such as rooms of buildings. The technique employs ozone and water vapor in a photolysis process to generate OH radicals within the enclosure. The water vapor is introduced via a carrier gas (compressed air) which passes through a bubbler prior to introduction to the enclosure. The procedure is performed at atmospheric pressure, or at a slight under-pressure (200-750 Torr) as a precaution against leakage of the reagents from a treated room.

In contrast, the method and system of the present invention provide plasma sterilization in which ozone and water vapor are introduced into an evacuated chamber with a pressure less than 1 Torr, within which plasma is generated by an electrical discharge.

The Examiner has suggested that it would have been obvious to a person having ordinary skill in the art to employ the ozonizer and water vapor supply of D'Ottone and the electrode and pulse/cycle configuration of Jacob in the system of Bithell to reach the invention as claimed.

In response, the Applicant wishes to point out that a person having ordinary skill in the art would not have motivation and/or a reasonable expectation of success in attempting to combine the teachings of Bithel and D'Ottone.

Firstly, it is important to note that the D'Ottone reference relates to a completely different class of sterilization processes from that of the Bithel reference. The D'Ottone process is conducted by use of photolysis at near-atmospheric pressure and belongs to the general class of atmospheric-pressure sterilization processes. Processes of this type based upon use of ozone have been practiced for roughly 40 years. Bithel on the other hand relates to field of low pressure plasma processes, also a well developed field of at least 10 years, but which employs starkly different physical processes and engineering considerations. Reactions and processes performed in atmospheric-pressure processes are not typically transferable or given to simple modification to render them effective or even operative in a low-pressure plasma process. Thus, one familiar with the teachings of Bithel would not consider the document of D'Ottone relevant as a source for possible modifications of the Bithel technique.

Furthermore, even if he were to consider combining the teachings, a person having ordinary skill in the art would consider the ozone and water vapor supply system of D'Ottone essentially incompatible with a low-pressure plasma system for at least two reasons. Firstly, the ozone and water vapor supply system of D'Ottone as stated above is based on transport of water vapor by compressed air in parallel to the ozone flow. This arrangement inherently requires significant volumetric flow rates, which are suited to the intended application of D'Ottone for disinfecting buildings, but is clearly completely unsuited for use with a high vacuum system.

Secondly, the water vapor supply system of D'Ottone is based on bubbling gas through water, thereby generating a significant proportion of microscopic water droplets entrained in the gas flow. This is further evidenced by D'Ottone's references to water droplets in paragraphs [0011] and [0015]. Given that the vapor pressure of

water is about 17.5 Torr (effectively reduced to about 11 Torr by cooling of some water droplets into ice during introduction into a high vacuum), this presence of water droplets is inherently incompatible with low pressure plasma discharge which requires pressures below 1 Torr as claimed, and the presence of such water droplets would immediately result in increased pressure and extinguishing of the plasma discharge.

For at least the above reasons, a person having ordinary skill in the art would find the teachings of D'Ottone incompatible with the process of Bithel, and would therefore lack all reasonable expectation of success by trying to combine the teachings of D'Ottone with Bithel. As a result, the combination suggested by the Examiner lacks the basic conditions set out by the MPEP in Section 706.02(j) for a prima facie finding of obviousness under 35 USC § 103(a).

In view of the above arguments, the Applicant respectfully submits that the claim rejections under § 103(a) are improper. Reconsideration of these rejections is respectfully and sincerely requested.

In view of the above amendments and remarks it is respectfully submitted that independent claims 1 and 20, and hence also dependent claims 2-15 and 21-38, are in condition for allowance. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,

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